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10/587,433	07/26/2006	Anne Boer	TS1407 US	1421
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SHELL OIL COMPANY			YOUNG, NATASHA E	
P O BOX 2463			ART UNIT	
HOUSTON, TX 772522463			PAPER NUMBER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/587,433

Applicant(s)

BOER ET AL.

Examiner

NATASHA YOUNG

Art Unit

1797

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 September 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SE-08)
Paper No(s)/Mail Date 09/30/2008
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The phrase "such as" in claims 1, 9, and 17 renders the claims indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-4, 9, 11-13, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Savin et al (US 4,060,127) in view of Kummel et al (US 3,802,497).

Regarding claim 1, Savin et al discloses a removable heat transfer module (bundle of tubes) having first and second ends, for use in a reactor for carrying out an exothermic reaction, the heat transfer tubes comprising a heat transfer feed tube (2); a distribution chamber; a plurality of circulation tubes (5); and a collection chamber (8, 9); said heat transfer feed tube (2) having at its first end an inlet (2) for charging the heat transfer module with heat transfer fluid, and communicating with said distribution chamber at its second end; each of said circulation tubes communicating with the distribution chamber through a first end and communicating with said collection chamber through a second end; the collection chamber having an outlet (14) for discharging coolant; wherein the inlet and the outlet are both located towards the same end of the heat transfer module, wherein the inlet is adapted to be removably

connectable to a charge pipe and the outlet is adapted to be removably connectable to a discharge pipe (see column 2, line 56 through column 4, line 26 and figure 1), where it is interpreted that hollow tube (2) is the inlet, heat transfer feed tube, and distribution chamber and where it is disclosed that the heat exchanger is designed to make it possible to remove and replace only that section to which is ruptured tube belongs.

Savin et al does not explicitly disclose coolant module but Savin et al discloses heat-consuming agent that flows through heat transfer tube (5) which are bundled together such that the heat-consuming agent acts as a coolant and the heat transfer tube bundle is a coolant module.

Savin does not disclose the inlet and outlet can be disconnected without the use of a cutting means.

Kummel et al discloses the inlet and outlet can be disconnected without the use of a cutting means (see figure 1; column 6, lines 32-36; and column 8, lines 1-11) by use of flanges.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Savin et al with the teachings of Kummel et al such that the inlet and outlet can be disconnected without the use of a cutting means in order to easily the inlet and outlet for cleaning or replacement.

In addition, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the inlet and outlet can be disconnected without the use of a cutting means, since it has been held that constructing a formerly

integral structure in various elements involves only routine skill in the art (see MPEP 2144.04 (V-C)).

Claims 2-3 depend on claim 1 such that the reasoning used to reject claim 1 will be used to reject the dependent portions of the claims.

Regarding claim 2, Savin et al discloses wherein the second end of the heat transfer feed tube forms the distribution chamber with the circulation tubes connected thereto (see figure 1).

Regarding claim 3, Savin et al discloses wherein the coolant feed tube is located substantially centrally with respect to the circulation tubes (see figure 1).

Claim 4 depends on claim 3 such that the reasoning used to reject claim 3 will be used to reject the dependent portions of the claims.

Regarding claim 4, Savin et al discloses wherein the coolant feed tube protrudes through the collection chamber (see figure 1).

Regarding claim 5, Savin et al discloses a bundle of circulation tubes (see column 3, lines 12-19).

Savin et al does not disclose the heat transfer tube bundle comprising between about 20 and about 4,000 circulation tubes.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the heat transfer tube bundle comprising between about 20 and about 4,000 circulation tubes, since it has been held the where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (see MPEP 2144.05).

Regarding claim 6, Savin et al discloses a bundle of circulation tubes (see column 3, lines 12-19).

Savin et al does not disclose the heat transfer tube bundle wherein each of the tubes has a length of about 4 to about 40 meters.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the length of the tubes are about 4 to about 40 meters, since it has been held the where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (see MPEP 2144.05).

Regarding claim 7, Savin et al discloses a bundle of circulation tubes (see column 3, lines 12-19).

Savin et al does not disclose the heat transfer tube bundle wherein the diameter of each circulation tube is from about 1 to about 10 cm.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the diameter of each circulation tube is from about 1 to about 10 cm, since it has been held the where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (see MPEP 2144.05).

Regarding claim 8, Savin et al does not disclose a heat transfer module (bundle of tubes) having a square, triangular, rectangular, trapezoidal or hexagonal cross section.

It would have been an obvious matter of design choice to have a heat transfer module (bundle of tubes) having a square, triangular, rectangular, trapezoidal or hexagonal cross section, since applicant has not disclosed that a heat transfer module (bundle of tubes) having a square, triangular, rectangular, trapezoidal or hexagonal cross section solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with a heat transfer module (bundle of tubes) having a square, triangular, rectangular, trapezoidal or hexagonal cross section.

Regarding claim 9, Savin et al discloses a reactor for carrying out an exothermic reaction (see column 2, lines 56-62 and column 3, lines 20-45) which discloses a cylindrical shell (1) where a heating agent is supplied and the heat is transferred to the heat-consuming agent that travels through the heat transfer tubes (5) such that a reaction is taking place within the cylindrical tube (1), said reactor comprising a reactor shell (1); an inlet (12) for introducing reactants into the reactor shell; an outlet (13) for removing products from the reactor shell; and at least one removable heat transfer module having first and second ends, for use in a reactor for carrying out an exothermic reaction, the heat transfer module comprising a heat transfer feed tube; a distribution chamber; a plurality of circulation tubes (5); and a collection chamber (8, 9); said heat transfer feed tube having at its first end an inlet (2) for charging the heat transfer module with heat-consuming agent, and communicating with said distribution chamber at its second end; each of said circulation tubes communicating with the distribution chamber through a first end and communicating with said collection chamber through a second end; the collection chamber having an outlet (14) for discharging heat-consuming agent;

wherein the coolant feed tube inlet and the collector chamber outlet are both located towards the same end of the heat transfer module (see column 2, line 56 through column 4, line 26 and figure 1), where it is interpreted that hollow tube (2) is the inlet, heat transfer feed tube, and distribution chamber and where it is disclosed the heat exchanger is designed to make it possible to remove and replace only that section to which is ruptured tube belongs.

Savin et al does not explicitly disclose coolant module but Savin et al discloses heat-consuming agent that flows through heat transfer tube (5) which are bundled together such that the heat-consuming agent acts as a coolant and the heat transfer tube bundle is a coolant module.

Savin et al does disclose the coolant feed tube inlet and the collection chamber outlet can be disconnected without the use of a cutting means.

Kummel et al discloses the coolant feed tube inlet and the collection chamber outlet can be disconnected without the use of a cutting means (see figure 1; column 6, lines 32-36; and column 8, lines 1-11) by use of flanges.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Savin et al with the teachings of Kummel et al such that the coolant feed tube inlet and the collection chamber outlet can be disconnected without the use of a cutting means in order to easily the inlet and outlet for cleaning or replacement.

In addition, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the coolant feed tube inlet and the collection

chamber outlet be able to be disconnected without the use of a cutting means, since it has been held that constructing a formerly integral structure in various elements involves only routine skill in the art (see MPEP 2144.04 (V-C)).

Regarding claim 11, Savin et al discloses a reactor, in which the heat-consuming feed tube (2) protrudes through the collection chamber (8, 9) (see figure 1).

Regarding claim 12, Savin et al discloses a bundle of circulation tubes (see column 3, lines 12-19).

Savin et al does not disclose the heat transfer tube bundle comprising between about 4 and about 100 circulation tubes.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the heat transfer tube bundle comprising between about 4 and about 100 circulation tubes, since it has been held the where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (see MPEP 2144.05).

Regarding claim 13, Savin et al discloses a reactor wherein the reactor shell (1) comprises an access for accessing the heat-consuming agent module (see column 4, lines 21-25), which discloses the heat transfer tube bundles may be accessed to remove and replace damaged tube bundles.

Regarding claim 16, Savin et al does not disclose a reactor wherein the outlet comprises a filter.

Filters are known in the art.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have reactor with a filter, since it was known in the art that filters are used to purify a fluid (see MPEP 2144.03 (A-E)).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a filter at the outlet of the reactor, since it has been held that rearranging parts of an invention involves only routine skill in the art (see MPEP 2144.04 (VI-C)).

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Savin et al (US 4,060,127) and Kummel et al (US 3,802,497) as applied to claim 9 above, and further in view of applicant's admitted prior art.

Regarding claim 10, Savin et al does not disclose a reactor wherein the inlet is adapted to be removably connectable to a charge pipe and the outlet is adapted to be removably connectable to a discharge pipe.

Applicant admits that the removably connectable means to be used comprises means in the art, see for instance Perry's Chemical Engineers' Handbook, 6th Edition, Chapter 6, 6-41/6-57 and suitable means are flanges, threaded joints (using single or double threaded connection joints), clamp joints, seal ring joints, pressure seal joints, compression fitting joints etc (see page 6, lines 26-33).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Savin et al with the applicant's admitted prior art such that the inlet is adapted to be removably connectable to a charge pipe and

the outlet is adapted to be removably connectable to a discharge pipe for the predictable result of easy removable of parts.

Claims 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Savin et al (US 4,060,127) and Kummel et al (US 3,802,497) as applied to claim 9 above, and further in view of GB 787,123.

Regarding claim 14, Savin et al does not disclose a reactor further comprising a support for supporting the cooling module.

GB 787,123 discloses a bundle of tubes (27) supported by support member (31) (see page 4, line 103 through page 5, line 26).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Savin et al with the teachings of GB 787,123 for the predictable result of extra support.

Regarding claim 15, Savin et al does not disclose a reactor wherein the inlet comprises a sparger.

GB 787,123 discloses a reactor with a sparger (41, 42) (see page 5, lines 61-85).

The combination of the prior art elements of a reactor with a removable cooling module and a sparger would have yielded the predictable result of even distribution of fluid into the reactor.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Savin et al (US 4,060,127) in view of Kummel et al (US 3,802,497).

Regarding claim 17, Savin et al and Kummel et al do not disclose a method for carrying out an exothermic reaction comprising the steps of: charging a reactor with

reactants; cooling the contents of the reactor and removing products from the reactor, wherein cooling is carried out using at least one cooling module comprising a coolant feed tube; a distribution chamber; a plurality of circulation tubes; and a collection chamber; said coolant feed tube having at its first end an inlet, for charging the cooling module with coolant, and communicating with said distribution chamber at its second end; each of said circulation tubes communicating with the distribution chamber through a first end and communicating with said collection chamber through a second end; the collection chamber having an outlet for discharging coolant; wherein the inlet and the outlet are both located towards the same end of the cooling module, wherein the inlet is adapted to be removably connectable to a charge pipe and the outlet is adapted to be removably connectable to a discharge pipe such that they can be disconnected without the use of a cutting means.

However, the prior art references disclose an apparatus capable of carrying out the method such that claim 17 is rejected using the same reasoning used to reject claim 9.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Savin et al (US 4,060,127) and Kummel et al (US 3,802,497) as applied to claim 17 above, and further in view of GB 787,123.

Regarding claim 18, Savin et al does not disclose a process for the synthesis of hydrocarbons wherein the reactor is charged with syngas.

However, Savin et al discloses an apparatus capable of carrying out the method such that claim 18 is rejected using the same reasoning used to reject claim 15.

Response to Arguments

Applicant's arguments with respect to claims 1-18 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **NATASHA YOUNG** whose telephone number is 571-270-3163. The examiner can normally be reached on Mon-Thurs 7:30 am-6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/N. Y./
Examiner, Art Unit 1797

/Walter D. Griffin/
Supervisory Patent Examiner, Art Unit 1797